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ABSTRACT

This guide defines assistive technology as specialized hardware and software equipment used by students with disabilities to increase their ability to participate in tasks of learning and daily living and function as independently as possible. Types of assistive technology are listed, and information resources about assistive technology are noted. A team approach to making decisions about assistive technology for each student is recommended. The roles of occupational and physical therapists in contributing to this child study team are then discussed, with physical therapists having expertise in assistive technology related to mobility and occupational therapists having expertise in assisting students with the activities of daily living, environmental control, writing, and keyboarding. The contributions of the special education teacher and speech/language therapist are also examined. Assistive technology issues that need to be addressed by the team include evaluation procedures, selection of technology, implementation, and monitoring. A detailed table lists services provided by therapists in schools, the purpose of each service, and questions that other team members may want to ask occupational and physical therapists about the services and assistive technology. A list of 14 print and 6 organizational resources and a glossary conclude the guide. (JDD)

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Center for Special Education Technology

Tech Use Guide
Using Computer Technology

The Role of the Occupational and Physical Therapist in Assistive Technology

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As recently as 5 years ago, technology was unavailable to most students with disabilities. Today, technology impacts the lives of everyone with applications ranging from NASA to Nintendo. In the fields of special education and rehabilitation, assistive technology includes a broad range of devices (such as computers with adapted input and/or output, augmentative communication devices, powered mobility devices, robotics, and environmental controls) and software programs (such as language training, word prediction, and cognitive retraining). Even the late adopters of innovation are now in a position of needing to learn about the hardware and software that comprises assistive technology.

What Is Assistive Technology?

Assistive technology is specialized hardware and software equipment used by students with disabilities to increase their ability to participate in tasks of learning and daily living and function as independently as possible. Students may be able to benefit from using one or all of the following types of devices:

Adapted toys—Mechanical and nonmechanical toys have been modified so that a student with limited motor control can use them.

Mobility and seating devices—Powered and manual wheelchairs, motorized toys, carts, and scooters can enable a student to move independently.

Augmentative communication aids—Manual and electronic communication devices increase a nonspeaking students ability to learn language, participate in normal school activities, and communicate effectively.

Personal computers and modification—Computers can be used for written communication, recreation, vocational training, and many other activities. Single switches, alternate keyboards, and keyguards are a few of the modifications a student may use to input information. Computer output may include voice output as well as visual display. Special software can make the computer a very effective learning tool for students with learning disabilities or cognitive deficits.

Environmental controls—A student with limited motor ability can use environmental controls in a variety of ways, such as turning on lights, TVs, and video games, adjusting the house thermostat, or changing the position of a hospital bed.

Vocational adaptations—Modifications to a work site may include work station modifications, adapted computers, specialized software, or the use of telecommunication to deliver work done at home.

As special educators investigate the ways in which assistive technology can benefit their students with disabilities, they can employ a variety of information resources. These resources include national computer databases and technical assistance projects, state education agencies, university training programs, and medical evaluation centers. There are a variety of publications such as the *Tech Use Guides* from the Center for Special Education Technology, newsletters such as *Closing the Gap* and *Assistive Device News*, RESNA publications, and national databases that can help professional educators expand their knowledge of assistive technology.

No matter what combination of resources are used to gain information about assistive technology, when it comes to making decisions about an individual student, the core decision-making group is made up of a team of professionals from various disciplines who serve the student on a daily basis. This team may be called the child study team (as it is called in this article), student service team, teacher assistance team, the related services team, and so forth. A knowledgeable, well-functioning child study team is the key to making the best, most effective decisions for each student. No single professional, no matter how knowledgeable, should make assistive technology decisions alone. Each specialist contributes unique professional knowledge in the development, implementation, and evaluation of students' programs. The overall quality of the decisions made by the team is enhanced by the contribution of each member as it strives to facilitate, maintain, and/or increase the performance of a student. Two of the key players on the child study team are often the occupational therapist (OT) and the physical therapist (PT). This Tech Use Guide will describe the unique contributions that occupational and physical therapists make to the child study team.

The Roles of Occupational and Physical Therapists

Traditionally, physical therapists have focused on functional mobility, while occupational therapists have concentrated on self-help and fine motor skills. Although there is some overlap in the training of occupational and

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physical therapists (such as normal and abnormal motor development, normal and abnormal movement patterns, etiologies of disabling conditions, etc.), each brings his or her own area of expertise to the child study team.

The services of a physical therapist include assessment of students and development and implementation of programs in the following areas:

- Postural and gross motor development; for example, head control, sitting and standing balance.
- Gait training and functional mobility for maximum independence within the education environment.
- Wheelchair mobility and transfer skills.
- Improvement of strength and coordination and prevention of deformity.
- Respiratory function for improvement and, in some cases, maintenance of health.

Physical therapists also plan for equipment adapted to each student's individual need, particularly for positioning and mobility; for example, individually fitted wheelchairs, prone boards, and braces. They often design, construct, or adapt equipment when nothing is available commercially to meet a student's specific needs.

Occupational therapists assess students and develop and implement programs in the following areas:

- Fine motor functioning; for example, grasp, coordination of both hands, and eye-hand coordination.
- Motor planning, body awareness, visual and spatial perception, sequencing, and problem solving for motor movement.
- Academic readiness and prevocational skills, and play/leisure skills.
- Independence in activities of daily living; for example, feeding, dressing, home living skills, writing, and keyboarding.

The design, construction, or adaptation of a large variety of adaptive devices and equipment has long been part of the contribution of occupational therapists to educational services, particularly in the areas of writing, keyboarding, feeding, positioning, and communicating.

Role in Assistive Technology

The role of physical and occupational therapists in assistive technology relates to their traditional areas of service. Physical therapists should have expertise in assistive technology related to mobility. They will work primarily with students who have a motor disability. They should be a resource to the team concerning each student's motor abilities and needs; for example, appropriate positioning, desirable movement patterns, potential placement of switches, the student's strength and motor control, and so forth.

Occupational therapists should have expertise in assistive technology to assist students with the activities of daily living, environmental control, writing, and keyboarding. The occupational therapist's role may be broader than that of the physical therapist because occupational therapists have traditionally dealt with increasing independence throughout all aspects of daily life. Occupational therapists work with a variety of students with disabilities including those with learning disabilities, traumatic brain injury, mental retardation, and emotional difficulties. Their expertise in positioning and fine motor skills is valuable in seating and placement of equipment for all students—not just those with physical disabilities. The occupational therapist often provides a broad range of services in the application of assistive technology. Identification, evaluation, recommendation, procurement, fit, training, and monitoring of use are all areas where the OT can make a significant contribution. The OT's understanding of the disabled individual's everyday functional needs and abilities also enables him or her to provide input into the design, development, and clinical application of new technology devices. The OT's orientation toward the provision of adaptive solutions, coupled with an understanding of the individual's task demands and impairments, may place the OT in the unique position of coordinating the application of assistive technology services in many schools.

Getting the Most from the Therapists

For members of the child study team to work effectively together, it is important to recognize the unique contribution each member can make. Because educators and therapists are often inexperienced in working closely together, all team members may need to spend extra time educating the rest of the team members about the particular kinds of information they can contribute. Figure 1 illustrates the individual contributions made by therapists and educators to the child study team.

Other team members can facilitate this interaction by asking the OT and PT appropriate questions. This is especially important when the therapist is not a member of the child study team. When therapy information comes from a clinical setting or from a therapist who provides infrequent consultation, the child study team needs to present specific questions to the consulting therapist.

Table 1 discusses the services that therapists provide to schools. Team members may want to ask questions similar to the ones in Table 1 as they work to improve an individual student's access to technology.

Team Roles in Assistive Technology

The emergence of assistive technology as an integral part of the educational program has placed new constraints on the team members. Understanding and utilizing assistive technology has become a necessary part of providing services to students with disabilities. Everyone on the child study team must have a basic understanding of the kinds of assistive technology that exist and how they can be used to help a student achieve more independence and control of his or her environment.

In addition, someone on the team must:

- Develop expertise in the operation of specific assistive technology devices; for example, setting up adaptive systems, installing and operating adaptive equipment, programming alternative keyboards, and so forth.

- Learn the pros and cons and strengths and weaknesses of specific assistive technology devices; for example, the advantages and disadvantages of scanning, or which devices might be appropriate for a visually impaired, nonspeaking student with cerebral palsy who can utilize a standard keyboard with a keyguard, and so forth.
- Know the resources to search for further information; for example, the Trace Center, Closing the Gap's Annual conference, data bases (such as Hyper Abledata), and local resources.
- Network with others using assistive technology in their city or state.
- Read publications that report current developments and new applications in assistive technology such as *Closing the Gap* or *Assistive Device News*.

The assignment of the role of technical expert is decided by the team. Each individual's interests, background, time available, access to training, and any other factors will influence the team as they decide which members should pursue specific expertise. In many cases, the team may decide that two or more members will seek information and training in assistive technology, thus dividing up the areas of responsibility. Regardless of which team member acquires the information, the key to insuring that it is adequately used is good team functioning.

Addressing Assistive Technology Issues

Evaluation

When teachers, parents, occupational therapists, physical therapists, and other members of the child study team meet to decide what technology applications are most appropriate for an individual student, the team's first task is to collect as much information about the student as possible. The team as a whole is much "smarter" than any individual member and will be able to make better technology decisions based on sharing different points of view. Team members may have information to contribute in every area, but an individual's special way of looking at the student may focus more heavily on one of the evaluation areas. The occupational and physical therapist could be expected to focus on the physical/motor and perceptual abilities of the student during this phase

In developing an IEP the child study team gathers or develops the following information:

Student identification data—for example, age, placement, disabling condition, prognosis.

Figure 1. Individual Contributions to the Child Study Team
(Arrows indicate potential collaborative cooperation and crossover)

Physical Therapist

Traditional Roles:

- Gross motor development
- Wheelchair skills
- Gait training
- Functional mobility
- Muscle strengthening
- Posture and positioning
- Equipment for positioning and mobility

Assistive Technology Roles:

- Powered mobility

Occupational Therapist

Traditional Roles:

- Fine motor development
- Feeding/eating
- Independence in daily living activities
- Functional equipment
- Visual and spatial perceptions

Assistive Technology Roles:

- Adapting equipment
- Positioning switches

Special Education Teacher

Traditional Roles:

- Cognitive development
- Play/social development
- Academic instruction
- Behavioral management
- Prevocational and vocational skills

Assistive Technology Roles:

- Opportunities for use in daily schedule
- Implementation training

Speech/Language Therapist

Traditional Roles:

- Language development, content, form, and pragmatics
- Augmentative/alternative communication
- Articulation
- Voice quality and fluency

Assistive Technology Roles:

- AC devices
- Language development and articulation software

Current level of functioning—for example, academics, self-help, communication.

Current educational goals—for example, academic, social, behavioral, communication, motor, recreational, perceptual.

Long-range educational goals—for example, personal independence, vocational.

Physical abilities—for example, gross motor skills, fine motor abilities, stamina, limitations.

Perceptual abilities—for example, visual acuity, auditory figure ground, reaction time.

Behavioral concerns—for example, interest in technology application, interfering behaviors, motivation, attention.

Once this information is available, the child study team asks: "Can assistive technology help this student meet his or her goals?" If the answer is yes, then this additional information should be gathered:

How assistive technology will be used—for example, academic work, language training, communication, cognitive retraining, and so forth.

Previous technology experience—for example, computers, communication devices.

Availability of equipment—for evaluation; for long-term use.

Specific equipment or device(s) needed—at least one for each application.

Alternatives to complex technology—for example, if we can't get the equipment, can we begin some other way, such as, low-tech devices, a personal assistant, use of peers?

Selection

Once information is gathered and shared, technology applications can be selected for trial by the student. Often the occupational therapist or physical therapist does the initial work with a student and a new assistive technology device. For example, before a student with a motor impairment can use a particular assistive technology device, he or she must have physical access to it. Occupational therapists and physical therapists are experts at analyzing how the human body moves and how to make adaptations when it is not moving in the usual way. They understand how the student will operate a particular device and what modifications may need to be made to improve its accessibility. They may also comment on the possible effects of long-term use of such a device on the student's body. In some cases a person may gain motor function by using a device which encourages motoric accuracy or range of motion. In other cases, repetitive movements may hurt an individual by increasing contractures or causing muscle strain. In addition, even students with a mild physical disability or no physical disability at all can be adversely affected by a table that is too high or too low or a chair that doesn't give adequate support.

Once the student has physical access to a device, the OT and PT will work cooperatively with other members of the team as they assess the device to make sure it is appropriate for the student's cognitive abilities, visual functioning, auditory skills, and so forth. Every member of the child study team should have the opportunity to work with the student using the assistive devices being evaluated in order to select the device(s) which best meet the established educational goals.

Implementation

When an assistive technology device has been evaluated and selected for a student, the work of the child study team has only begun. There are four areas that the child study team must continually address during implementation: (1) equipment considerations, (2) student training considerations, (3) staff and parent training considerations, and (4) management considerations. The following questions can be used in child study team meetings to plan for effective implementation of an assistive technology program for the student.

Equipment Considerations

1. Where will the equipment come from? (School district budget? Special education budget? State, loan bank, if one exists?)
2. Where will the student use this technology (e.g., home, classroom, playground)?
3. Will a device be located in each environment? If yes, where (e.g., at the back of the room, in a central location)?
4. Will equipment be moved from place to place? If yes, how?
5. Which adults will be responsible for equipment in each environment where it is used?
6. Are there consumable supplies associated with this device? If yes, who will provide them?

Student Training Considerations

1. For what purposes will the student use this device (e.g., communication, academics, socialization)?
2. What specific skills does the student need to learn or refine to use the device?
3. Who will provide initial training for the student?
4. How much training is needed (time/day)?
5. When will training occur?
6. Where will training occur?

Staff and Parent Training Considerations

1. Who are the individuals in the student's life who need to know how to use this device (e.g., parents, teacher, siblings, peers)?
2. What specific skills do others need to learn to help the student use the device?
3. Who will provide training to these individuals?
4. How much training is needed?
5. When will training occur?

Table 1

SERVICES PROVIDED BY THERAPISTS IN SCHOOLS

Services Provided	Purpose of Therapy/ Relationship to Education	Questions to Ask Occupational and Physical Therapists
Positioning—Positioning with adaptive devices, training of staff in handling methods, range of motion, skin care, managment of splints and braces. (PT/OT)	To maintain the student in the best position for learning and functional use of hands.	• What positioning do you recommend for this student considering each assistive device the child will be using? • How can this student be positioned to allow access to all the devices selected (e.g., powered mobility, augmentative communication, computer)? • Are any of the positions in which the student is being placed detrimental to the student's performance? • What devices and/or practices regarding positioning and seating will help this child develop independence and strength?
Adaptive Equipment—Evaluate, recommend, and construct positioning devices, modify existing devices, determine best placement for switches. (OT/PT)	To provide the student with a stable postural base to allow attention to be focused on educational tasks.	• What life functions could be enhanced by the use of assistive technology? • What adaptive input or output devices could help this student operate a computer or other equipment?
Functional Mobility—Activities to increase equilibrium and balance reactions and transfer skills. (PT) Practice in mobility and transfer skills, use of adaptive equipment, manual and power wheelchairs, braces, and artificial limbs. (PT)	To permit the student greatest freedom of movement within the educational setting.	• Are there mobility aids that this child should use? • What are the child's long-range possibilities for independent mobility? • Are there simulation programs or software to train this student to operate a powered mobility device?
Self-Help—Practice in activities of daily living, such as grooming, toileting, and feeding. (OT)	To permit this student to manage personal needs in the school with a minimum of assistance.	• What kinds of assistive technology could increase this student's independence and self-help skills? • We have identified an assistive device that will help this student become more independent in self-help skills. How can we modify it so it better meets the student's physical needs? • What equipment, devices, and practices will encourage this student's self-help ability at feeding time? In mainstreamed class? In communications, and so forth?
Fine Motor—Evaluate and improve fine motor functions such as reach, grasp, object manipulation, and dexterity. (OT).	To facilitate the student's ability to manipulate classroom objects and tools such as writing implements, puzzles, art materials, tools, and adaptive devices.	• How will the student's fine motor deficits affect use of this device? • Is there an assisitve device which may help the student compensate for fine motor deficits?

Table 1 cont.
SERVICES PROVIDED BY THERAPISTS IN SCHOOLS

Services Provided	Purpose of Therapy/ Relationship to Education	Questions to Ask Occupational and Physical Therapists
Environmental Adaptations—Recommend modification of school's or student's equipment or removal of architectural barriers. (PT/OT)	To permit the student access to and mobility within the educational environment.	• What are the barriers to independence in this student's environment? • Should seating, positioning, room arrangment, or building modifications be made? • Are there technology-based solutions to some of these environmental barriers? Are they appropriate in this situation?
Vocational Skills—Activities to improve general strength, sitting and standing balance and tolerance, motor coordination, use of adaptive equipment. (PT/OT) Vocational interest and aptitude assessment and recommendations for placement, prevocational training, social-emotional readiness, adaptive homemaking. (OT)	To prepare the student for the most independent life possible, including vocational placement (supportive to educational and vocational programs).	• How will the student's general strength, sitting and standing balance and tolerance, and coordination affect the ability to work? • What modifications can be made to the work environment to make it more accessible to the student? • What input/output adaptations and/or specialized software would make it possible for this student to use a computer for a vocational application?
Neuromuscular and Musculoskeletal Systems—Activites to increase muscle strength, endurance, range of motion, gross and fine motor coordination, motor planning, oral-motor control, control of muscle tone and integration of developmentally appropriate reflexes and reactions as the basis for more normal movement. (PT/OT) Activites to prevent musculoskeletal deformities and deviations. (PT)	To enable the student to participate maximally in school activities and remain in school the full school day. To increase speed, accuracy, and strength in manipulative skills in preacademic and academic tasks.	• Will the student's strength, coordination, or endurance affect use of this device? Is the student in danger of developing deformities or further disabilities as a result of long-term use of this device in this position? • What response time can be expected for the input methods we selected? How can the student improve academic performance using technology as a tool? • How often should the student move, stretch, or change positions? What alternative positions are appropriate?
Sensory Processing—Equilibrium and protective reactions, muscle tone, integration of touch, visual, auditory, proprioceptive, and kinesthetic input, motor planning, coordination of the 2 sides of the body. (OT)	To facilitate the student's ability to process and respond to sensory and motor information as a foundation for developing gross and fine motor skills and for organizing attention and behavior. To help bridge the gap between underlying sensory processing abilities and developing higher-level language and learning skills.	• How does the student's sensory processing abilities affect use of this device? • Does the student need technology adaptations such as larger type, slower operation, amplified speech, etc., to compensate for sensory processing deficits? • What specialized software is available to help this student improve sensory processing?
Physiological Function—Cardiorespiratory function and fitness, muscular strengthening. (PT)	To strengthen muscular, respiratory, and cardiovascular systems to increase endurance to remain in school the full day.	• How will the student's physiological functioning affect the ability to accomplish educational goals? • Can the student's body mechanics be improved to increase independence in the use of the assistive technology devices chosen?

Management Considerations

1. Who will monitor the overall program of use of this device?
2. How much direct supervision does the student require when using the device?
3. Who will provide supervision and assist in the day-to-day operation of the device?
4. Who should be called if the device does not work properly?
5. Will other students share the device? How will this be managed?

Monitoring

Monitoring is an ongoing process, as important as evaluation, selection, and implementation. The child study team must set regular time lines to review progress and effectiveness of the implementation plan. No matter how well planned a program is initially, there will always be refinements as the student changes or problems arise. The previous questions can be revisited in the monitoring process to determine what modifications will need to be made.

Assistive technology can make an exciting difference in the life of a student with a disability. The child study team can effectively address each student's assistive technology need by working together and utilizing each discipline's unique knowledge and contribution. The OT and PT, with their extensive knowledge of body mechanics, positioning, and adaptive devices, can be especially valuable resources. In addition, a variety of excellent resources are available, such as those included in the resource section.

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Resources

Publications

Apple Computer Resources in Special Education and Rehabilitation. DLM, Inc., One DLM Pk., Allen, TX 75002.

Assistive Device News. Newsletter available from the Central Pennsylvania Special Education Regional Resource Center, 150 South Progress Ave., Harrisburg, PA 17109.

Assistive Technology. The official journal of RESNA. Available from Demos Publications, Inc., 156 Fifth Ave., Suite 1018, New York, NY 10010.

Assistive Technology Sourcebook. Alexandra Enders, Editor. Available from RESNA Press, Suite 700, 1101 Connecticut Ave., NW, Washington, DC 20036.

Closing the Gap. Newsletter available from Closing the Gap, Inc., P.O. Box 68, Henderson, MN 56044.

Computers in the Mainstream: A Planning Guide. Available from the Coalition for Assistive Technology in Oregon, P.O. Box 431, Winchester, OR 97495.

Computers in the Special Education Classroom. Available from the Coalition for Assistive Technology in Oregon, P.O. Box 431, Winchester, OR 97495.

Control of Computer-based Technology for People with Physical Disabilities: An Assessment Manual. Available from University of Toronto Press, 10 St. Mary St., Suite 700, Toronto, Canada M4Y 2W8.

Rehabilitation Technologies: Thirteenth Institute on Rehabilitation Issues. David W. Corthell, Editor. Available from the University of Wisconsin—Stout, Rehabilitation Research and Training Center, Menomonie, WI 54751.

Rehabilitation Technology Service Delivery: A Practice Guide. Available from RESNA Press, Suite 700, 1101 Connecticut Ave., NW, Washington, DC 20036.

Seating, Positioning, Mounting and Physical Access Bibliography. Available from Pennsylvania Assistive Device Center, 150 South Progress Ave., Harrisburg, PA 17109.

Spectrum. Newsletter available from the Center for Rehabilitation Technology Services, 1410-C Boston Ave., P.O. Box 14, West Columbia, SC 29171-0015.

Trace Center Resource Books on Communication, Control, and Computer Access for Disabled and Elderly Individuals. Trace R & D Center, S-151 Waisman Center, University of Wisconsin, Madison, WI 53705-6696.

Window on Technology. Newsletter available from the Program Technology Branch, Ministry of Community and Social Services, 12th Floor, 5140 Yonge St., North York, Ontario, Canada M2N 6L7.

Organizations

American Occupational Therapy Association, Inc., 1383 Piccard Dr., P.O. Box 1725, Rockville, MD 20850-0822; 301/948-9626.

American Physical Therapy Association, Inc., 111 North Fairfax St., Alexandria, VA 22314.

Apple Computer, Inc., Office of Special Education and Rehabilitation, 2052 Mariani Ave., Cupertino, CA 95014; 408/996- 1010.

Center for Computer Assistance to the Disabled, Inc., (C-CAD), 617 7th Ave., Fort Worth, TX 76014; 817/870-9082, 817/870-9086 (TDD).

IBM National Support Center for Persons with Disabilities, P.O. Box 2150, Atlanta, GA 30055; 404/364-2189.

RESNA, Suite 700, 1101 Connecticut Ave., NW, Washington, DC 20036; 202/857-1199.

Glossary

Abduction: Sideways movement of the limbs away from the body.

Active range of motion: A person's own movement of arms, legs, head, and trunk.

Activities of daily living: Those activities necessary for self-care (e.g., eating, dressing, personal hygiene).

Adaptive positioning: The provision of supports and adaptive equipment to optimize the functional abilities of individuals with physical impairments.

Adduction: Sideways movement of the limbs toward the midline of the body.

Ambulation: The act of walking with or without assistance or the use of assistive devices.

Assistive device: Mechanical and/or electrical equipment designed to increase an individual's ability to interact with the environment.

Ataxia: Irregularity of muscle action; inability to coordinate voluntary muscular movements in a smooth, balanced manner. The staggering gait and tremor seen in ataxia are often compensated for by using a wide base of support.

Athetoid cerebral palsy: A congenital or early-acquired motor impairment characterized by frequent, involuntary, writhing movement.

Athetosis: Repeated involuntary movements that are purposeless, but often associated with deliberate movements, especially severe in the hands.

Atrophy: A wasting away; a reduction in the size of a cell, tissue, muscle, organ, or body part.

Bilateral: Pertaining to both sides of the body.

Bolster: A long, narrow, rounded pillow or cushion. A pillow rolled over and tied makes a good bolster. The size of the bolster must be suited to the size of the person using it.

Cerebral Palsy: A nonprogressive disorder of movement or posture beginning in childhood due to a malfunction or damage of the brain.

Contracture: A permanent shortening of a muscle-tendon unit (muscle, ligament, tendon, and/or joint capsule) due to spasticity or paralysis, or prolonged positioning in a shortened position resulting in less than normal range of motion of a joint.

Deformity: A distortion or malformation of any part of the body.

Degenerative disease: A condition or illness that gets progressively worse. Progression may be fast or slow and there may be periods during which the condition stabilizes.

Diplegia: Muscle involvement of similar parts of the body; usually refers more to legs than arms.

Dominant side: Side of the body used most often and with greater skill and coordination than the opposite side.

Etiology: The cause or origins of a disease or abnormal condition; also theory and study of the factors that cause diseases or abnormal conditions.

Extension: The straightening of a joint, which diminishes the angle between bones that meet in the joint; the opposite of flexion.

Extremities: Arms and legs; also used synonymously with limbs.

Fine motor skills: Activities using the smaller muscles in the body, such as functional hand activities.

Flaccid: Floppy; absent or low muscle tone.

Gross motor skills: Activities using the larger muscles in the body; for example, head control, trunk control, creeping, sitting, standing, running.

Head control: Ability to bring the head into a straight, upright position when the body is tilted in any direction.

Hemiplegia: Spastic muscular involvement of one side of the body; for example, right arm and right leg spasticity.

Hypertonic: Increased muscle tone.

Hypotonic: Decreased muscle tone.

Midline: An imaginary line drawn from the head to the toes that separates the body into right and left halves.

Midline positioning: Placing the trunk, upper, and lower extremities into aligned, symmetrical, and neutral posturing.

Mixed cerebral palsy: Congenital or early acquired motor impairment with both athetoid and spastic characteristics.

Mobility: Capability to move or to be moved (i.e., movement of a body muscle or body part, or movement of the whole body from one place to another).

Nondominant side: Side of the body used less often; usually has less skill and coordination than the dominant side.

Orthopedist: A medical doctor (surgeon) specializing in the treatment of bones, joints, and muscles.

Prone: Lying horizontally on abdomen.

Range of motion: The excursion of moving joints from their fully extended position to their fully flexed position, or vice versa.

Rotation: Turning of a body part.

Spastic cerebral palsy: A congenital or early acquired motor impairment characterized by limited or jerky movements.

Spasticity: Involuntary, pathologically increased muscle tone causing stiffness of movement because it is difficult to relax.

Stabilize: Provide extra support to secure certain joints.

Supine: A person positioned horizontally on the back with the face upward (backlying).

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